YAKHONTOV, A.D.

PLOTNIKOV, Nikolay Ivanovich; SYROVATKO, Mikhail Vasil'yevich; SHCHEGOLEV, Dmitriy Ivanovich; YAKHONTOV, A.D., redaktor; SHUSTOVA, V.M., redaktor izdatel'stva; MIKHAILOVA, V.V., tekhnicheskiy redaktor.

[Underground water in ore deposits] Podzemnye vody rudnykh mestorozhdeniĭ. Pod nauchnoi red. D.I.Shchegoleva. Moskva, Gos.naichno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1957. 614 p. (MIRA 10:11)

(Water, Underground) (Ore deposits)

Yakhontov, Alexey Dmitriyevich

YAKHONTOV, Aleksey Dmitriyevich; VOL'PIN, D.I., otvetstvennyy red.; BEKKER, O.G., tekhn.red.; NADEINSKAYA, A.A., tekhn.red.

[Work with explosives] Vzryvnye raboty. Moskva, Ugletekhizdat, 1957. 189 p. (MIRA 11:3)
(Explosives) (Blasting)

YAKHONTOV, A.D.

PAVLOV, Konstantin Vasil'yevich; POKROVSKIY, N.M., prof., doktor nauk, retsenzent; YAKHONTOV, A.D., kand.tekhn.nauk, retsenzent; PARTSEVSKIY, V.N., red.izdatel'stva; ISLENT'YEVA, P.G., tekhn.red.

[Mining; mine tunneling and timbering] Gornye raboty, provedenie i kreplenie vyrabotok. Izd.3-e, perer.i dop. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1957. 583 p. (MIRA 11:1)

(Mine timbering) (Mining engineering)

PHASE I BOOK EXPLOITATION 845

Yakhontov, Aleksey Dmitriyevich, Ivanov, Konstantin Ivanovich, Zinyuk, Yuriy Nikolayevich, Usevich, Ignat Vasil'yevich

Oksilikvity, ikh proizvodstvo i primeneniye (Liquid Oxygen Exlposives, Their Manufacture and Use) Moscow, Metallurgizdat, 1958. 230 p. 2,200 copies printed.

Ed.: Garkalenko, K.I.; Ed. of Publishing House: Partsevskiy, V.N.; Tech. Ed.: Islent'yeva, P.G.

PURPOSE: This book is for engineers and technicians working in mining industry and planning organizations. It can be used as a practical handbook in the organization and performance of mining blasting operations.

COVERAGE: This book covers the general topic of liquid oxygen explosives, also called oxyliquits, used in the USSR and abroad. The

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physicochemical properties of oxyliquits are described, as well as the manufacture of cartridges with the use of various absorbents. Blasting operations, safety procedures, and liquid oxygen techniques are also included. Much attention is given to the oxyliquits with peat as the absorbent which were used in the Noril'sk open-pit operations from 1942 - 1956, where the authors were employed at that time. The authors participated in the study of new explosives and of their industrial application. The technique of blasting with oxyliquits is described in detail for the case of percussion-cable drilling. A comparative evaluation of oxyliquits as explosives for mining operations is also included. There are 89 tables, 91 figures, and 56 references, 40 of which are Soviet, 14 English, and 2 French.

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Liquid Oxygen Explosives (Cont.) 845

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AVAILABLE: Library of Congress

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GO/nah
12-9-58

LUGOVSKIY, Sergey Ivanovich; YAKHONTOV, A.D., red.; PARTSEVSKIY, V.N., red. izd-va; ISLENT'YEV, P.G., tekhn. red.

[Ventilating mines after large explosions] Provetrivanie shakht posle massovykh vzryvov. Moskva, Gos. nauchno-tekh. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1958. 272 p. (MIRA 11:8)
(Mine ventilation)

Yakhontov, A.D.

ANDROS, I.P., inzh.; ASSONOV, V.A., kand. tekhn. nauk.; BERNSHTEYN, S.A., inzh.; BOKIY, B.V., prof.; BROVMAN, Ya.V., inzh. BONDARENKO, A.P., inzh.; BUCHNEV, V.K., kand. tekhn. nauk; VERESKUNOV, G.P., kand. tekhn. nauk; VOLKOV, A.F., inzh.; GELESKUL, M.N., kand. tekhn. nauk; GORODNICHEV, V.M., inzh.; DEMENT'YEV, A.Ya., inzh.; DOKUCHAYEV, M.M., inzh.; DUBNOV, L.V., kand. tekhn. nauk; ZEPIFANTSEV, Yu.K., kand. tekhn. nauk.; YERASHKO, I.S., inzh.; ZEKDANOV, S.A., kand. tekhn. nauk; ZIL'BERBROD, A.F., inzh.; ZINCHENKO, E.M., inzh.; ZORI, A.S., inzh.; KAPLAN, L.B., inzh.; KATSAUROV, I.N., dots.; KITAYSKIY, E.V., inzh.; KRAVTSOV, Ye.P., inzh.; KRIVOROT, S.A., inzh.; KRINITSKIY, L.M., kand. tekhn. nayk; LITVIN, A.Z., inzh.; MALEVICH, N.A., kand. tekhn. nauk; MAN'KOVSKIY, G.I., doktor tekhn. nauk; MATKOVSKIY, A.L., inzh.; MINDELI, E.O., kand. tekhn. nauk; NAZAROV, P.P., kand. tekhn. nauk; NASONOV, I.D., kand. tekhn. nauk; NEYYENBURG, V.Ye., kand. tekhn. nauk; POKROVSKIY, G.I., prof., doktor tekhn. nauk; PROYAVKIN, E.T., kand. tekhn. nauk; ROZENBAUM, inzh.; ROSSI, B.D., kand. tekhn. nauk; SKIRGELLO, O.B., inzh.; SKMEVSKIY, V.N., doktor tekhn. nauk; SUKHUT, A.A., inzh.; SUKHANOV, A.F., prof., doktor tekhn. nauk; TARANOV, P.Ya., kand. tekhn. nauk; TOKAROVSKIY, D.I., inzh.; THUPAK, N.G., prof., doktor tekhn. nauk; FEDOROV, S.A., prof., doktor tekhn. nauk; FEDYUKIN, V.A., inzh.; KHOKHLOVKIN, D.M., inzh.; KHRABROV, N.I., kand. tekhn. nauk; CHEKAREV, V.A., inzh.; CHERNAVKIN, N.N., inzh.; SHREYBER, B.P., kand. tekhn. nauk; EPOV, B.A., kand. tekhn. nauk; YAKUSHIN, N.P., kand. tekhn. nauk; YANCHUR, A.M., inzh.; YAKHONTOV, A.D., inzh.; POKROVSKIY, N.M., otvetstvennyy red.; KAPLUN, Ya.G. [deceased], red.; MONIN, G.I., red.; SAVITSKIY, V.T.,

(Continued on next card)

ANDROS, I.P.---(continued) Card 2.
red.; SANOVICH, P.O., red.; VOLOVICH, M.Z., inzh., red.; GORITSKIY, A.V., inzh., red.; POLUYANOV, V.A., inzh., red.; FADEYEV, M.I., inzh., red.; CHECHKOV, L.V., red. izd-va; PROZOROVSKAYA, V.L., tekhn. red.; NADEINSKAYA, A.A., tekhn. red.

[Mining; an encyclopaedic handbook] Gornoe delo; entsiklopedicheskii spravochnik. Glav. red. A.M. Terpigorev. Moskva, Gos. nauchno-tekhnicheskoe izd-vo lit-ry po ugol'noi promyshl. Vol.4 [Mining and timbering] Provedenie i kreplenie gornykh vyrabotok. Red-kollegiia toma: N.M.Pokrovskii... 1958. 464 p. (MIRA 11:7)

(Mine timbering) (Mining engineering)

YAKHONTOV, A.D.

MARTYNOV, Vitaliy Kos'movich; KHOROSHEV, Oleg Vasil'yevich; YAKHONTOV, A.D., red.; SMOLDYREV, A.Ye., red.izd-va; MIKHAYLOVA, V.V., tekhn.red.

[Operator of mine drainage units; a textbook for on-the-job training of workers] Mashinist shakhtnykh vodootlivnykh ustanovok; uchebnoe posobie dlia proizvodstvenno-tekhnicheskogo obucheniia rabochikh. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1959. 200 p. (MIRA 12:4)
(Mine pumps)

YAKHONTOV, Aleksey Dmitriyevich; DOKUCHAYEV, M.M., gornyy inzhener, retsenzent; ROMADINOV, A.V., gornyy inzhener, retsenzent; NADION, M.F., red.; AVSZIENOK, A.F., red.izd-va; ISLENT'YEVA, P.G., tekhn.red.

[Blasting operations and explosive materials] Vzryvnye raboty i vzryvchatye materialy; uchebnoe posobie dlia proizvodstvenno-tekhnicheskogo obucheniia vzryvnikov. Moskva, Gos.nauchno-tekhn. izd-vo lit-ry po gornomu delu, 1959. 328 p. (MIRA 12:10)
(Blasting) (Explosives)

PLOTNIKOV, Nikolay Ivanovich; SHCHEGOLEV, D.I., prof., doktor geol.-miner.nauk, nauchnyy red.; YAKHONTOV, A.D., red.; SHUSTOVA, V.M., red.izd-va; MIKHAYLOVA, V.V., tekhn.red.

[Water supply of mining enterprises; prospecting, location and estimates of underground water supplies] Vodosnabzhenie gornorudnykh predpriiatii; poiski, razvedka i podschet zapasov podzemnykh vod. Pod red. D.I.Shchegoleva. Moskva, Gos. nauchno-tekhn.izd-vo lit-ry po gornomu delu, 1959. 528 p. (MIRA 12:9)

(Mining engineering--Water supply)
(Water, Underground)

GOLDAYEV, Ivan Prokhorovich; POLEVICHEK, Yevgeniy Pavlovich; POPOV, Nikolay Nikolayevich; MOTORNENKO, Aleksey Petrovich; SEROGODSKIY, Al'bert Viktorovich; YAKHONTOV, A.D., otv.red.; SMOLDYREV, A.Ye., red.izd-va; LOMILINA, L.N., tekhn.red.; SHKLYAR, S.Ya., tekhn.red.

[Using thermal methods in working frozen ground] Razrabotka merzlykh gruntov termicheskim sposobom. Moskva, Gos.nauchno-tekhn. izd-vo lit-ry po gornomu delu, 1960. 46 p. (MIRA 13:4)
(Frozen ground) (Boring)

BARON, Lazar' Izrailevich, prof., doktor tekhn.nauk, red.; DOKUCHAYEV, Mikhail Moiseyevich; VASIL'YEV, Georgiy Aleksandrovich; DOROHICHEVA, Lyudmila Arkad'yevna; SLASTUNOV, V.G., gornyy inzh., retsenzent; ROMADINOV, A.I., gornyy inzh., retsenzent; YAKHONTOV, A.D., otv.red.; SIPYAGINA, Z.A., red.izd-va; KOROVENKOVA, Z.A., tekhn.red.

[Blasting operations in ore mining; a handbook] Vzryvnye raboty v gornorudnoi promyshlennosti; spravochnoe posobie. Pod red. L.I. Barona. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po gornomu delu, 1960. 181 p. (MIRA 13:3)
(Mining engineering)

VOZDVIZHENSKIY, Boris Ivanovich; SKORNYAKOV, Aleksandr L'vovich. Prinimal uchastiye BASHKATOV, D.N. YAKHONTOV, A.D., otv.red.; YEROKHIN, G.M., red.izd-va; GALANOVA, V.V., tekhn.red.

[Drilling blast holes] Burenie vzryvnykh skvazhin. Moskva, Gos. nauchno-tekhn.izd-vo lit-ry po gornomu delu, 1960. 428 p. (MIRA 14:4)

(Boring)

YANKONTOV, A. G.

Dissertation: "Roentgenographic Investigation of the Plastic Deformation of Surface Layers of Metals Being Polished." Cand Phys-Math Sci, Leningrad State Pedagogical Inst, Leningrad, 1953. Referativnyy Zhurnal--Khimiya, Moscow, No 8, Apr 54.

SO: SUM 284, 26 Nov 1954

YAKHONTOV, A.G.

Category : USSR/Solid State Physics - Structure of Deformable Materials E-8

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6734

Author : Terminasov, Yu.S., Yakhontov, A.G., Poltavskiy, A.V.
Inst : Leningrad Engineering-Economic Institute, USSR
Title : X-ray Diffraction Investigation of the Surface Quality of Metals, Treated by Grinding and Fine Cutting.

Orig Pub : Izv. AN SSSR, ser. fiz., 1956, 20, No 6, 689-692

Abstract : An X-ray-diffraction method (using the broadening and attenuation of the interference lines), and the microhardness method were used to study the dependence of the intensity of hardening on the metal surface and the distribution of the hardening through the thickness of the surface layer on the technological treatment conditions. Grinding or cutting the lathe strengthens the surface layer of the metal, this being evidenced by an increase in the microhardness by 30 -- 70%, a broadening of the diffraction lines by 100 -- 200%, and a reduction in the relative intensity of the lines by 40 -- 76%, depending on the working conditions. The width of the

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Category : USSR/Solid State Physics - Structure of Deformable Materials E-8

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6734

surface zone of a metal with a distorted structure, reaches 120 microns in the case of grinding, and approximately 200 microns in the case of fine cutting in the lathe. The authors believe that the degree and thickness of the strengthened surface layer of a specimen can be adjusted by changing the depth of the cut.

Card : 2/2

YAKHONTOV, A.G.

TERMINASOV, Yu.S.; YAKHONTOV, A.G.; POLTAVSKIY, A.V.

X-ray analysis of the quality of ground and finish-turned metal surfaces. Uch. zap. Ped. inst. Gerts. 125:49-54 '56. (MLRA 9:12)

(Metallography)

SOV/137-58-7-15751

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 7, p 264 (USSR)

AUTHOR: Yakhontov, A. G.

TITLE: Investigation of the Surface of Ground Metals (Issledovaniye poverkhnosti shlifovannykh metallov)

PERIODICAL: Uch. zap. fiz.-matem. fak. Kirg. un-t, 1957, Nr 4, part 1, pp 89-97

ABSTRACT: The effect of grinding on the strengthening of the surface layer of U8 steel and technical Fe was investigated by means of X-ray analysis and microhardness inspection. The depth of grinding was measured within 5-75 μ limits, the speed of the longitudinal advance rate of the table ranged within the limits of 2.1-49 mm per revolution, and the cutting surface speed was 30-50 m/sec. It was determined that grinding increases microhardness by 30-70% and the width of the interference lines by 10-100%. A particularly sharp modification of this parameter occurs in the range of small depths of grinding (5-10 μ). With light grinding, when the temperature rise is insufficient to cause weakening, the lattice distortion is greater in Fe than in steel because

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SOV/137-58-7-15751

Investigation of the Surface of Ground Metals

plastic Fe deforms more. The microhardness of ground specimens of both steel and Fe does not vary with an increase in the speed of longitudinal advance though lattice distortions vary because of this by 30-40%. Increase in cutting speed up to 30-50 m/sec almost invariably brings about a decrease in lattice distortion but affects the degree of strengthening very little.

1. Steel--Surface properties 2. Surfaces--Preparation I. G.
3. Surfaces--Metallurgical effects

Card 2/2

YAKHONTOV, A.G.

AUTHORS: Terminasov, Yu. S. and Yakhontov, A.G. 129-58-5-11/17

TITLE: Influence of Technological Factors on the Thickness of Cold-hardened Layer During Grinding (O vliyanii tekhnologicheskikh faktorov na glubinu naklepa pri shlifovanii)

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1958, Nr 5, pp 40-43 (USSR)

ABSTRACT: The results are evaluated of investigations of the internal layers located underneath a ground surface of annealed "U8" steel. To remove the individual layers, successive electro-chemical etching was applied and the degree of work hardening of the layer was evaluated directly on the basis of the changes in the micro-hardness (measured by Candidate of Technical Sciences A. A. Matalin). In addition, distortions of the atomic-crystal lattice were determined by X-ray structural analysis. Thereby it became possible to plot curves of the changes of the micro-hardness and of the distribution of the atomic lattice underneath the ground surface. In Figure 1 the dependence is graphed of the width and the relative intensity of the interference lines of the $(310)K_{\alpha}$- doublet as a function of the thickness of the removed surface layer for one

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specific grinding regime. In Fig.2 the same dependence is graphed for various depths of grinding. In Fig.3 the dependence of the relative intensity of the interferance on the thickness of the removed layer for various depths of grinding is graphed. The dependence of the micro-hardness on the thickness of the removed layer for various grinding depths is graphed in Fig.4. In Fig.5 the dependence is graphed of the depth of work hardening on the depth of grinding for various feed rates. It was established that the grinding produces in the surface layer a certain distribution of deforming forces. Assuming that this distribution corresponds to curve 1 of Fig.6 (distribution of the deforming forces in the surface zone of the metal during grinding) and curve 2 is the experimentally established dependence between the deforming forces and the work hardening, it is possible to determine the distribution of the work hardening under the surface layer by simple geometrical means (curve 3). Analysis of this simplified scheme allows certain conclusions which are substantiated by the results

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The Influence of Technological Factors on the Thickness of Cold-hardened Layer During Grinding

obtained in the here described work. The thickness of the layer with a distorted structure is determined by the depth to which the stresses exceeding the yield point penetrate. The character of the distribution of the distortions of the atomic lattice will depend on the distribution of the stresses in the metal during machining; in the case of light grinding regimes, a sharp transition should be observed between the distorted structure in the surface layer and the non-deformed one in the internal layers. The depth of intensive work hardening changes as a function of the grinding regime between 10 and 100 μ; the maximum distortion of the structure and the changes in the micro-hardness are observed in the about 10 μ thick surface layer. For producing a sufficiently thick and sufficiently highly work hardened surface layer, it is necessary to grind using large cutting depths. Minimum work hardening is obtained if high cutting speeds with very low depths of cut are used.

Card 3/3 There are 6 figures and 2 references, both of which are Soviet.

AVAILABLE: Library of Congress. 1. Steel-Effects of grinding 2. Steel-Hardening 3. Electrolytic etching-Applications 4. Steel-X-ray analysis

YAKHONTOV, A.G.

PHASE I BOOK EXPLOITATION SOV/4303

Frunze. Universitet. Nauchnoye studencheskoye obshchestvo

Sbornik nauchnykh rabot studentov, vyp. 2 (Collection of Scientific Works of Students, No. 2) Frunze, 1959. 99 p. 500 copies printed.

Sponsoring Agency: Kirgizskiy gosudarstvennyy universitet. Nauchnoye studencheskoye obshchestvo.

Resp. Ed.: L. A. Spektorov, Docent; Tech. Ed.: N. A. Yefimov.

PURPOSE: This book is intended for mathematicians, natural scientists, and philologists.

COVERAGE: The collection of articles contains studies in mathematics and mechanics, physics, biology, and philology written by members of the Nauchnoye studencheskoye obshchestvo (Students' Scientific Association) of Kirgizskiy gosudarstvennyy universitet (Kirgiz State University) under the guidance of faculty members. References accompany each article.

PHYSICS

BIOLOGY

Card 4/6

S/137/60/000/007/006/013
A006/A001

Translation from: Referativnyy zhurnal, Metallurgiya, 1960, No. 7, p. 251, # 15899

AUTHORS: Zaytsev, V. I., Yakhontov, A. G.

TITLE: Changes in the Fine Structure and Phase Composition of Stainless Steel Subjected to Compression and Aging

PERIODICAL: V sb.: Materialy 8-y Nauchn. konferentsii professorsko-prepodavat. sostava Fiz.-matem. fak. (Kirg. un-t). Frunze, 1959, No. 63

TEXT: An investigation was made of changes in the fine structure and phase transformations of austenite dispersion-hardening Cr-Ni X17N7Yu (Kh17N7Yu) steel when deformed by compression. It was established that the austenite structure became a 2-phase one when subjected to compression: a $\gamma - \alpha$ rearrangement of the crystal lattice took place. The strengthening observed was caused by the phase transformation, the sharp grain refinement of the matrix phase at the beginning of the deformation, and also by the disorientation of the γ-phase domains at a high degree of deformation. Considering the nature of steel strengthening established, it is suggested to regard the martensite formation

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S/137/60/000/007/006/013
A006/A001

Changes in the Fine Structure and Phase Composition of Stainless Steel Subjected to Compression and Aging

process as a $\gamma \rightarrow \alpha$ re-arrangement of the crystal lattice in the spots of dislocations observed when compressing the austenite specimen. A profound analogy was established in structural changes of Kh17N7Yu steel observed during its complicated four-fold heat treatment and the subsequent thermal and mechanical effect. This leads to the conclusion that 17N7Yu steel treatment can be made cheaper and simpler. The necessity is stressed of performing experiments under industrial conditions.

I. B.

Translator's note: This is the full translation of the original Russian abstract.

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SOV/129-59-5-4/17

AUTHORS: Yu.S. Terminasov, A.G. Yakhontov

TITLE: Influence of Grinding on the Distortions of the Crystal Structure of Metals (Vliyaniye shlifovaniya na iskazheniya kristallicheskoy struktury metallov)

PERIODICAL: Metallovedeniye i Termicheskaya Obrabotka Metallov, 1959, Nr 5, pp 19-23 (USSR)

ABSTRACT: The results are described of the influence of grinding regimes on the distortions in the structure of carbon steel U8 and commercial iron. The specimens were machined on a large grinding machine at various regimes. The grinding depths were 4, 10, 25, 37.5, 50 and 75 microns; the longitudinal feed rate of the table was 2.1, 3.9, 7.8, 13, 24 and 49 mm/rev. The machining speeds were 30 and 50 m/sec respectively. Investigations were carried out by the X-ray diffraction method and by the microhardness method. The structural distortions were evaluated from the changes in the widths and intensity of the interference lines. Microhardness measurements were also made; these enabled establishing the degree of hardness of the surface

Influence of Grinding on the Distortions of the Crystal Structure of Metals

On the basis of the obtained results, which are graphed and tabulated, it is concluded that the decrease in structural distortions in the surface layer in the case of fast methods of grinding is due to a decrease in the deformation forces and not to a softening effect caused by heat generation. Thus the depth of grinding is the most effective factor which regulates the thickness of the distorted layer (from 10 to 100 - 120 microns). The non-uniformities on the surface as well as a 10 micron thick layer adjacent to these, will become hardest. There are 7 figures, 1 table and 6 references, 5 of which are Soviet and 1 English.

ASSOCIATION: Leningradskiy Inzhenerno-ekonomicheskiy Institut (Leningrad Engineering-Economics Institute)

L 19674-63 EWT(m)/BDS/EWP(q) AFFTC/ASD JD
ACCESSION NR: AR3006979 S/0058/63/000/008/E031/E031

SOURCE: RZh. Fizika, 8E218

AUTHOR: Yakhontov, A. G.

TITLE: Dislocation model of lattice distortion and X-ray diffraction methods of estimating them

CITED SOURCE: Sb. Materialy* 10 Nauchn. konferentsii prof.-prepodavat. sostava fiz.-matem. fak. Sekts. fiz. Frunze, 1961. 13-15

TOPIC TAGS: lattice distortion, dislocation model, X-ray diffraction, block size

TRANSLATION: The glide plane of an edge dislocation is regarded as a boundary between two blocks. In this case the average magnitude of the distortion ε_0 of a block of dimension L_b will be $\varepsilon_0 = (a/2)/L_b$, where a -- lattice parameter, and on the other hand $\varepsilon_0 =$

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$= \Delta a/a$. These relations have been employed to estimate the sizes of the blocks and the distortions from the Fourier expansion coefficients in a harmonic analysis. The values of L_b and ε_0 were calculated from the data of Averbach and Warren for work-hardened filings of W. The obtained values of L_b, taking into account the distribution of the distortions along the block after Cauchy, deviated from the data of Averbach and Warren by less than 10%. If the distortion is assumed to have a Gaussian form, the values obtained for the blocks are too low and those for the distortions too high. It is noted that the proposed relation between ε_0 and L_b can be used to estimate the sizes of the blocks and the stresses from the integral value of the broadening of one line. V. Landa.

DATE ACQ: 06Sep63 SUB CODE: PH ENCL: 00

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L 19677-63 EWP(q)/EWT(m)/EWP(B)/BDS AFFTC/ASD JD

ACCESSION NR: AR3006976 S/0058/63/000/008/E027/E028

SOURCE: RZh. Fizika, Abs. 8E186

AUTHOR: Yakhontov, A. G.

TITLE: Procedure for estimating the thickness of the layer participating in the diffraction of X-rays

CITED SOURCE: Sb. Materialy* 10 Nauchn. konferentsii prof-prepodavat. sostava Fiz.-matem. fak. Sekts. fiz. Frunze, 1961, 34-35

TOPIC TAGS: D-ray, diffraction, layer thickness, extinction

TRANSLATION: Two methods are proposed for estimating the thickness of the layer participating in diffraction, a, with account of extinction. 1. Method of one interference line, in which the beam of X-rays was aimed at an angle 90 - φ to the polished surface and the ratio of the intensities of the diffracted rays covering paths a

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ACCESSION NR: AR3006976

and R sec2φ is estimated. 2. Method of two interference lines, in which the angle of incidence of the rays on the specimen is chosen in such a way as to make the path difference between the two diffracted rays maximal. Relations are presented for an estimate of R by both methods. It is recommended that the investigations be carried out in a type VRS camera. V. Landa

DATE ACQ: 06Sep63 SUB CODE: PH ENCL: 00

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1-1700

27546
S/148/61/000/004/004/008
E193/E580

AUTHORS: Zaytsev, V.I. and Yakhontov, A.G.

TITLE: On the possibility of using mechanical instead of thermal treatment for hardening steel X17H7Yu (Kh17N7Yu)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya, no.4, 1961, pp.93-96

TEXT: In addition to its excellent corrosion resistance, the 17-7 stainless steel is characterized by high strength and plasticity. The optimum combination of mechanical properties is imparted to this steel by a 4-stage heat treatment: 1) holding for 2 hours at 1100°C and cooling in air; 2) holding for 2 hours at 700°C and cooling in air; 3) operation (2) repeated; 4) tempering for 4 hours at 600°C and cooling in air. Steel, heat-treated in this manner, has an impact strength of 5-8 kgm/cm^2 and a Rockwell C hardness of 30. It has been shown by L. S. Moroz (Ref.2: Fine Structure of Steel and its Strength, Gostekhizdat, 1957) that structural changes brought about in steel by heat-treatment (hardening) can be attained also by plastic deformation. The effect of these two treatments on the mechanical properties of steel is similar, and both lead to residual distortions of the second type.

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and to dimensions of the regions of coherent scattering which are smaller (in comparison with annealed material). The only difference is that, for a given degree of hardening, plastic deformation produces larger distortions of the third type (local lattice distortions). From these considerations the authors inferred that the thermal treatment could be replaced by a more economical treatment consisting of the following: 1) holding for 1-2 hours at 1100°C and quenching in a 10% NaCl solution; 2) cold rolling (compression) at room or sub-zero temperatures; 3) tempering at 450-600°C for 4 hours, followed by quenching in a 10% NaCl solution. To check the effectiveness of this treatment, specimens of the Kh17N7Yu steel, quenched from 1100°C, were compressed to 6-52% deformation at 18 and -78°C and tempered for 4 hours at 480 and 600°C, after which the proportion of the α-phase, P_α, the block dimensions, L_γ, the degree of micro-distortion ε_γ, and hardness of the specimens were determined. Results confirmed the effectiveness of the new method. Thus, L_γ was 8×10^{-5}-10^{-6} cm in the plastically-deformed specimen as compared with 8×10^{-5}-8×10^{-6} cm in steel tempered (twice) at 700°C, the corresponding figures for

On the possibility of using ...

ε being 8×10^{-4} -25×10^{-4} and 3×10^{-4} -17×10^{-4}, respectively. P_{α}^{γ} varied between 50 and 70% in specimens tempered at 700°C; the same results could be attained by 16-30% plastic deformation at low temperatures. Finally, mechanical treatment followed by tempering brought the hardness to 30-40 Rockwell C, hardness of the thermally-treated material being 30-35 Rockwell C. There are 1 table and 3 Soviet references.

ASSOCIATION: Frunzenskiy politekhnicheskiy institut (Frunze Polytechnical Institute)

SUBMITTED: December 22, 1959

Card 3/3

DENISOV, A.S.; YAKHONTOV, A.G.

Effect of heating on the electric conductivity and fine structure of deformed copper. Izv. AN Kir. SSR. Ser. est. i tekh. nauk 3 no.1:35-40 '61. (MIRA 14:7)

(Metals--Effect of temperature on)
(Copper--Electric properties)

S/137/62/000/006/129/163
A052/A101

AUTHORS: Denisov, A. S., Yakhontov, A. G.

TITLE: An installation for investigating thermal fatigue of metals at pulse loads

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 6, 1962, 77, abstract 6I485 ("Izv. AN KirgSSR. Ser.yestestv. i tekhn. n.", v. 3, no. 1, 1961, 141 - 145, Kirghiz summary)

TEXT: An installation for investigating thermal fatigue of metals (or for annealing plastically deformed metals) at pulse thermal loads was designed. The installation is assembled by a twin electric bridge circuit where the investigated specimen is connected as the unknown resistance and the calibrated resistance is substituted by a standard resistance; thereby the pulse power and the specimen resistance can be determined. The installation enables one to carry out investigations in a broad temperature range from -196°C to melting point. The heating rate of the specimen is controlled by pulse power. Elementary diagram of the installation is given.

V. Ferenets

[Abstracter's note: Complete translation]

Card 1/1

S/148/61/000/012/006/009
E193/E383

10.7400 4016

AUTHORS: Yakhontov, A.G. and Kozlov, P.M.

TITLE: Distribution of the α-phase on [the surface of] fatigue-fracture of stainless steel 1Х18Н9Т (1Kh18N9T)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya, no. 12, 1961, 114 - 116

TEXT: Studies of the constitution of alloys in the zone of fatigue-fracture can provide valuable information on the mechanism of fracture due to cyclic loading - hence the present investigation carried out on specimens of steel 1Kh18N9T (17.9% Cr), chosen for this purpose because the austenite in this steel is particularly prone to change into α-phase during plastic deformation. Specimens 17 mm in diameter with a notch 2 mm deep and having austenitic structure and a grain size of approximately 5×10^{-3} cm were used in tests conducted on a rotating-cantilever-beam-type machine. Each test was run to fracture, which in specimens tested under a stress of 26, 28 and 30 kg/mm^2 occurred after 2 030 000, 1 032 000 and 650 000

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Distribution of ....

reversals, respectively. The surface of the fractured specimens was then examined by X-ray diffraction. The X-ray patterns showing both K_α(211) lines of the α-phase and K_β(311) and K_α(220) lines of the γ-phase were obtained for several points spaced radially at a distance of 1.3 mm from each other. Typical results are reproduced in Fig. 1, where the intensity, I , of the X-ray diffraction lines is plotted against the distance (n x 1.3 mm) of the point examined from the circumference of the specimen, circles, dots and crosses relating to (211), (311) and (220) lines, respectively. The proportion of α-phase was then calculated from the $I_{(211)}/I_{(220)}$ and $I_{(211)}/I_{(311)}$ ratios, where I denotes the intensity of the respective lines. The results of these calculations are reproduced in Fig. 2, where the proportion of the α-phase (%) is plotted against the distance from the circumference of the specimen. In discussing the results the authors distinguish between the zone of gradual (fatigue) fracture and the zone of

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Distribution of ....

final fracture corresponding to the immediate vicinity of point 7 of Figs. 1 and 2. It will be seen that the proportion of the α-phase increased gradually and reached its maximum at the boundary between these two zones and the following explanation is suggested of this effect. The plastic deformation-induced $\gamma \rightarrow \alpha$ deformation can take place only in material subjected to a stress σ_M, which must be at least slightly higher than the yield point of a given steel. In the initial stages of a fatigue test (conducted under a constant load), the stress remains relatively low until the first fatigue cracks are formed, which reduce the effective cross-section area of the specimen and consequently increase the magnitude of stress. The magnitude of the applied stress increases with increasing depth of the crack and so does the degree of plastic deformation which is reflected in an increased proportion of the α-phase formed. The sharp decrease in the intensity of the X-ray diffraction lines in the zone of final fracture and the corresponding decrease in the proportion of the α-phase could be explained only after supplementary studies in which the effect of micro-geometry of

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33172
S/148/61/000/012/006/009
E193/E383

Distribution of ....

the surface of the fracture on the intensity of X-ray diffraction lines would have to be taken into account.
There are 2 figures, 1 table and 3 Soviet-bloc references.

ASSOCIATION: Kirgizskiy gosudarstvennyy universitet
(Kirgiz State University)

SUBMITTED: October 10, 1960

Card 4/4

25915 S/126/61/012/001/007/020
E111/E435

18.7520

AUTHOR: Yakhontov, A.G.

TITLE: X-Ray spectroscopic investigation of non-uniform distribution of nickel in stainless steels

PERIODICAL: Fizika metallov i metallovedeniye, 1961, Vol.12, No.1, pp.51-54

TEXT: The author proposes a simple method for studying the known non-uniformity of alloying-atom distribution. For this he uses ordinary X-ray spectroscopic analysis, avoiding the complications of the "point" (Ref.4: Borovskiy I.B. and Il'in, N.P. Metallurgiya SSSR, 1917-1957, Vol.2, M., 1959) method. [Abstractor's note: The "point" may well be the Castaing method.] He has applied it to the determination of nickel distribution in types Х17Н7Ю (Kh17N7Yu) and 1Х18Н9Т (1Kh18N9T) steels. The author points out that variations in nickel content should affect phase composition. His analysis was carried out from primary spectra with a spectrograph adapted for dealing with massive specimens. This gives local distribution with depth, enabling non-uniformity on a surface to be detected. The author applied the method to fracture surfaces obtained under various

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loading conditions. Spectra were recorded on a high-sensitivity X-ray film, the exposures corresponding to the linear part of its characteristic curve. Deviations of check measurements from the mean did not exceed ± 5%. With filing, coarse machine polishing, maximal polishing, electro-polishing and repeated electro-polishing of 1Kh18N9T steel, the nickel concentration recorded did not differ significantly from the mean, i.e. they removed layers uniformly. It was found, however, that the nickel content in tensile fracture surfaces obtained at room temperature and 470°C was 7.1 and 9.1% respectively, that for the original state being 10.1%. To study nickel distribution in this fracture layer, successive thin layers were removed by electro-polishing and the surfaces analysed for nickel. Fig.1 shows nickel concentration against depth of layer (microns) for room temperature and 470°C fractures (curves 1 and 2, respectively) and for a standard polished section (curve 3). Variations were also found in fatigue fractures, some layers have higher and some the average nickel content; different sides of the same fracture could have different concentrations (e.g. 12.4 and 10.1%). There is, however, as yet insufficient evidence for the conclusion that fatigue cracks spread where there are high

concentration gradients. A study was also made of nickel distribution non-uniformity in austenitic ferritic Kh17N7Yu steel. Specimens were annealed at 1100°C, quenched twice from 700°C and tempered at 600°C. Fractures were produced in impact tests. Significant non-uniformity was observed but here there was no significant difference between the nickel concentration in two sides of a given fracture. Acknowledgments are expressed to A.Zherdev, B.Petrenko, Saadanbekov and A.Kudryavtsev for assistance in the work. There are 1 figure, 4 tables and 5 references: 4 Soviet and 1 non-Soviet. The reference to an English language publication reads as follows:
Smoluchovski R. Clustering in Solid Solutions, International Conference on Physics of Metals, The Hague Martinus, 1949, 179.

ASSOCIATION: Kirgizskiy gosudarstvennyy universitet
(Kirgiz State University)

SUBMITTED: October 24, 1960

S/126/62/014/003/006/022
E111/E335

AUTHORS: Kozlov, P.M. and Yakhontov, A.G.

TITLE: Influence of the rupture temperature on the structure of fatigue fractures in the steel 1Х18Н9Т (1Kh18N9T)

PERIODICAL: Fizika metallov i metallovedeniye, v. 14, no. 3, 1962, 387 - 390

TEXT: The kinetics of the $\gamma \rightarrow \alpha$ transformation in fractures of 1Kh18N9T steel produced by applying alternate strain at high temperatures and the influence of the deformation temperature on the structure of the γ- and α-phases in the fatigue-fracture zone were investigated on specimens in which stress-concentration notches, 0.3 mm deep, were produced by electrolytic polishing. Cycles with stresses of 28 kg/mm^2 were applied at temperatures of 50, 160, 190, 250, 360, 450, 530 and 610 $\pm$ 15 °C. Since in the fatigue-fracture zone the phase transformations are localized within a very narrow layer, X-ray structural phase analysis was applied, which enabled the martensite transformation to be followed in the surface layer, 8 - 12 μ thick. The number of cycles to failure fell sharply with increasing temperature up

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Influence of ....

to about 250 °C (about 0.8 x 10^5 cycles) and then stayed almost constant. The concentration of the α-phase decreased sharply up to 250 °C in all the sections of the fracture, whilst there was no α-phase at all in the fracture at 450 °C. The temperature of 450 °C evidences that there is a general characteristic in the formation of all the fracture zones. To some extent, this is analogous to the temperature point M_d which characterizes the stability of austenite during fatigue fracture. The great difference between the points M_d for torsion (60 °C) and for fatigue fracture (450 °C) evidences that during fracture the γ-lattice is distorted to a greater extent than during torsional deformation. The alpha-phase concentration at the fracture indicates the degree of plastic deformation; the concentration in the pre-fracture zone was the same as in a tensile-fracture zone. Fatigue-fracture was accompanied by refining of the microstructure. The distortion of the gamma-phase was not due to the $\gamma \rightarrow \alpha$ transformation but to processes such as slip and fracture in austenite grains. There are 3 figures and 2 tables.

Card 2/3

S/126/62/014/003/006/022
E111/E335

Influence of ....

ASSOCIATION: Kirgizskiy gosudarstvennyy universitet (Kirgiz State University)

SUBMITTED: March 3, 1962

Card 3/3

ACCESSION NR: AR4041541 S/0137/64/000/004/I005/I005

SOURCE: Ref. zh. Metallurgiya, Abs. 4I28

AUTHOR: Zaytsev, V. I.; Gorbach, V. G.; Yakhontov, A. G.

TITLE: Change of structure of iron-nickel alloy during reverse martensite transformation

CITED SOURCE: Izv. AN KirgSSR. Ser. yestestv. i tekhn. n., v. 5, no. 6, 1963, ~~1039~~ 139-148

TOPIC TAGS: iron nickel alloy, martensitic transformation, heat treatment, x ray investigation

TRANSLATION: There was investigated an Fe-Ni alloy of composition (%): C 0.04, Si 0.38, Mn 0.33, Ni 28.33. Alloy underwent the following heat treatment: after hardening, test pieces were cooled to -200° in liquid N2 to obtain martensite, then heated to a temperature of 980° for carrying out reverse martensite transformation. In the investigated alloy direct martensite trans-

Card 1/2

ACCESSION NR: AR4041541

formation developes lower than -20°, and inverse--in the region of temperatures 400-500°. X-ray investigations established that the fine structure of an alloy experiencing direct and reverse martensite transformation is characterized by a small magnitude of blocks in crystallites and presence of significant disorientation of blocks and fragments with respect to grain. Block structure of martensite is transmitted, during reverse transformation, to austenite. During reverse transformation there is observed also inheritance of the angle of mosaic structure; alpha-delta-transformation is accompanied by development of fragmentation. Such state of structure is sufficiently heat resistant and is preserved to a temperature of~700°. It is shown that during the hardening phase, in the hardening, there occurs not only direct but reverse martensite transformation. Bibliography: 16 references.

SUB CODE: MM ENCL: 00

Card 2/2

IZMAYLOV, Ye.A.; GORBACH, V.G.; YAKHOTOV, A.G.

X-ray microbeam investigation of the structure of martensite and austenite during the direct and inverse martensite transformation in Fe-Ni alloys. Fiz. met. i metalloved. 16 no.3:349-354 S '63. (MIRA 16:11)

1. Kirgizskiy gosudarstvennyy universitet i Institut fiziki metallov AN SSSR.

SPASSKIY, M.N.; YAKHONTOV, A.G.

Preparation of objects from massive metal samples for direct study in an electron microscope. Zav.lab. 30 no.12:1490 '64.

(MIRA 18:1)

1. TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii im. I.P.Bardina.

L 5375[illegible]-65 EWT(m)/EWA(d)/T/EWP(t)/EWP(k)/EWP(z)/EWP(b)/EWA(c) Pf-4
HJW/JD/HW
ACCESSION NR: AR5006974 S/0137/65/000/001/I072/I072

SOURCE: Ref. zh. Metallurgiya, Abs. 1I-76

AUTHOR: Glukhenko, Z. Ye.; Milovanov, Yu. F.; Sokolkov, Ye. N.; Yakhontov, A. G.

TITLE: Investigation of crystal lattice imperfections in EI-481 steel after ausforming

CITED SOURCE: Sb. rabot Kafedry obshch. fiz. Kirgosun-ta. Issled. po fiz. tverd. tela. Frunze, 1964, 163-172

TOPIC TAGS: metallurgy, ferrous metal, metal structure, metal testing, heat treatment, metal ausforming

TRANSLATION: A connection was found between hardness and elements of the fine structure: the size of the elements in the mosaic structure, microdistortion of the crysta. lattice and grain [illegible]. 7.5-9.5% Mn, 11.5-13.5% Cr, 1.0-9.0% Ni, 1.25-1.55% V, 1.1-1.4% Mo, 0.25-0.45% Nb,

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L 53754-65
ACCESSION NR: AR5008974

remainder Fe) was subjected to plastic deformation (rolling speed 1.5 m/min, reduction 25-70%) at 800, 900, 950, 1000 and 1100°, with subsequent quenching in water to prevent recrystallization. Some of the samples were age-hardened at 750° for four hours. This treatment breaks up the grain and disturbs the crystal lattice. With [illegible]

at 1100° [illegible] companied by softening of the material. With age-hardening, hardness is increased to a constant magnitude (290 kg/mm^2) and is independent of deformation temperature. Bibliography, 8 titles. B. Samarin.

SUB CODE MM ENCL: 00

Card 2/2

L 51974-65 EWT(m)/EWA(d)/T/EWP(t)/EWP(k)/EWP(z)/EWP(b)/EWA(c) Pf-4/Pad
IJP(c) JD/HW

ACCESSION NR: AR5009005 S/0137/65/000/002/I013/I014

SOURCE: Ref. zh. Metallurgiya Abs. 2I103

32
B

AUTHOR: Smaylov, Ye. A.; Gorbach, V. G., Yakhontov, A. G.

TOPIC TAGS: metallurgy, metal testing, ferrous metal, metalworking, austenitic steel

TRANSLATION: The effect of carbon content on the mechanism of hardening ferro-

Card 1/2

L 51974-65
ACCESSION NR: AR5009005

At the same yield point for uncarburized and carburized alloys in the case of direct martensite conversion, residual austenite in the latter was deformed to a greater degree. In reverse martensite conversion, phase cold-hardened austenite has the same fine structure as martensite, and the degree of deformation increases with the amount of carbon retained in the martensite lattice during heating.

SUB CODE: MM ENCL: 00

Card 2/2

YAKHONTOV, A.G.

Reliability of the results of harmonic analysis in evaluating the fine structure of metals. Fiz. met. i metalloved. 18 no.2:294-299 Ag '64. (MIRA 18:8)

1. Kirgizskiy gosudarstvennyy universitet.

YAKHONTOV, A.M., gornyy inzh.

Mining museum of the Donets Basin. Nauka i zhyttia 10 no. 10:25-27 O '60. (MIRA 14:4)

1. Direktor Donetskogo muzeya nedr zemli (Artemovsk, Stalinskaya obl.).
(Artemovsk--Geological museums)

YAKHONTOV, A.P.

[Chemical analysis of oil shales; manual for laboratories of the Geologic Service] Khimicheskii analiz goriuchikh slantsev; posobie dlia laboratorii geologicheskoi sluzhby. Moskva, Gos. izd-vo geol. lit-ry, 1952. 39 p. (MLRA 7:6)
(Oil shales)

YAKHONTOV, A.P.

Plastics, their properties, preparation, and uses. Khim. v shkole 14 no.2:9-22 Mr-Ap '59. (MIRA 12:4)
(Plastics)

YAKHONTOV, A.P., zasluzhennyy uchitel' shkoly RSFSR

Calculation problems. Khim. v shkole 17 no.2:29-32 Mr-Ap '62.
(MIRA 15:3)

(Chemistry--Problems, exercises, etc.)

YAKHONTOV, B.D.

Occurrence of fulmar and purple heron in the Far East.
Ornitologiia no.6:486-487 '63. (MIRA 17:6)

YAKHONTOV, B. V.

Treatment of taeniarynchosis using acrichine at a day helmintho-logical infirmary. Zdrav. Tadzh. 9 no.2:28-30 Mr-Ap '62.
(MIRA 15:7)

1. Iz gel'mintologicheskogo dnevnogo statsionara pri Isfarinskoy gorodskoy bol'nitse (glavnyy vrach - N. Kh. Khaitov).

(TAENIA) (QUINACRINE)

YAKHONTOV, B.V.

Comparative evaluation of the effectiveness of different methods of treating ascariasis according to data of the Isfara Helminthological Day Hospital. Zdrav. Tadzh. 10. no.1:25-26 '63. (MIRA 16:7)

1. Iz Isfarinskogo meditsinskogo ob"yedineniya (glavnyy vrach N.Khaitova) i Isfarinskoy sanitarno-epidemiologicheskoy stantsii (glavnyy vrach N.Sattarov).
(ASCARIDS AND ASCARIASIS)

PEROV, Vitaliy Pavlovich; YAKHONTOV, G.K., kand. tekhn. nauk, retsenzent; RUDNITSKIY, I.F., nauchnyy red.; NIKITINA, R.D., red.; TSAL, R.K., tekhn. red.

[Designing of radar tracking systems with consideration of random actions] Raschet radiolokatsionnykh slediashchikh sistem s uchetom sluchainykh vozdeistvii. Leningrad, Gos. soiuznoe izd-vo sudostroit. promyshl., 1961. 167 p. (MIRA 14:8)

(Radar)

YAKHONTOV, G.Ye.

YEFREMOV, Vladimir Valentinovich, prof.; YAKHONTOV, G.Ye., red.; LESNYAKOV, F.I., red; MAL'KOVA, N.V., tekhn.red.

[Automibile repairing] Remont avtomobilei. Izd. 2-oe, ispr. i dop. Moskva, Nauchno-tekhn.izd-vo avtotransp. lit-ry. Pt.1. 1957. 373 p. (Automobiles--Maintenance and repair) (MIRA 11:2)

YAKHONTOV, I.P.

YAKHONTOV, I.P.

Yenisey basin during the years of Soviet government. Rech.transp. 16 no.11:22-23 N '57. (MIRA 10:12)

1. Nachal'nik sluzhby gruzovoy i kommercheskoy raboty Yenitseyskogo parokhodstva.

(Yenisey Valley--Inland navigation)

YAKHONTOV, K. N.

Astrometry, Photographic Astronomy (2596)

Soobshch. Gos. Inst. Im. Shternberga, No. 94, 1953, pp 27-31

"Comparison of Accuracy in Measurement of Extragalactic Nebulae and Stars on Photographs by the 15" Astrograph of Moscow Observatory GAISH"

Accuracies of measurements of extragalactic nebulae with those of stellar positions made by the astrograph of Moscow Observatory (F = 6,4 m,D = 38 cm) and measured on Repsold instrument are compared.

SO: Referativnyy Zhurnal-- Astronomiya i Geodeziya No. 3, 1954 (W-30907)

VARHANTOV L. N.

treatment of the ...

mixt. of 4 stereoisomers; all salts were oils. Refluxing 10 hrs. with concd. HCl gave 89.2% ...

ing I.HCl with 6% ... Heating 0.5 g. II.HCl salt with 50 ml. 17% HCl at reflux 8 ... heating with C and evapg. in vacuo followed by ...

and compds. related to II ... are shown graphically

G. M. Kosolapoff

YAKHONTOV, L.N.

6

Intermediate product in the synthesis of trichlorocollidine. M. V. Rubtsov and L. N. Yakhontov (S. Ordzhonikidze All-Union Sci. Research Chem.-Pharm. Inst., Moscow). *Zhur. Obshchei Khim.* 25, 1353-60(1955).—Heating 150 g. 6-hydroxy-4-methyl-2,3-(4,5-dihydro-2,3-furano)pyridine(I) and 450 ml. $POCl_3$ in a bomb 5 hrs. at below 160°, followed by ice-treatment, gave 98.5% crude product, which was purified by soln. in hot concd. HCl, cooling, sepn. of the ppted. HCl salt, soln. in Me_2CO, dilu. with H_2O, sepn. of the ppted. monohydrate and vacuum drying, yielding 20.6 g. *2,6-dihydroxy-3-(2-chloroethyl)-4-methylpyridine* (II) *monohydrate*, m. 133.5-4° (this is different than the constitution assigned by Stevens, *et al.*, *C.A.* 36, 4121[3]). This (10 g.) and 20 ml. $POCl_3$ heated in sealed ampul 5 hrs. at 180-90° and then quenched in ice gave the crude product, which after soln. in hot ligroine and distn. gave 62.8% *2,6-dichloro-3-(2-chloroethyl)-4-methylpyridine* (III), bp 159-61°, m. 69-70°, identical with the product prepd. according to S. (*loc. cit.*). I does not lose its Cl with Pd catalyst while heating with KOAc-AcOH cleaves 1 mole of KCl. II heated with EtOH gives I. The high temp. reaction of $POCl_3$ with I probably goes in stages: under 160° the furan ring is opened yielding a dichlorophosphate deriv. at the nuclear HO group, which intermediate in further reaction with $POCl_3$ at 180° yields III. Also in *J. Gen. Chem. U.S.S.R.* 25, 1304-7(1955)(Engl. translation).

G. M. Kosolapoff

CH

1

RUBTSOV, M.V.; YAKHONTOV, L.N.

Synthesis of the ethyl ester of 5-(β-methoxyethyl)quinuclidine-carboxylic acid-2. Zhur.ob.khim. 25 no.9:1743-1747 S '55(MIRA 9:2)

1.Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut imeni S.Ordzhonikidze.
(Quinuclidinecarboxylic acid)

YAKhontov, L. N.

CH

Synthesis of 3-(2-methoxyethyl)-4-methylpyridine. M. V. Rubtsov and L. N. Yakhontov (S. Ordzhonikidze All-Union Chem. Pharm. Sci. Research Inst., Moscow). *Zhur. Obshchei Khim.* 25, 1820–7(1955).—Refluxing 11.2 g. 2,6-dichloro-3-(2-chloroethyl)-4-methylpyridine (I) with 2 g. KOH in 200 ml. dry EtOH 8 hrs. and acidification with HCl gave 6.1 g. *3-vinyl analog* (II), b_{15} 95°, which does not form HCl salt, picrate or methiodide. I, which yields by reduction over Pd-β-collidine. Refluxing 4.2 g. fresh Ag_2O with 5.0 g. I and 60 ml. dry pyridine 6 hrs. gave 2.7 g. II, b_{16} 136–40°, and 2.3 g. recovered I, b_{15} 182–5°. II (1.88 g.) treated with 2.4 g. Br_2 in $CHCl_3$ readily gave *the dibromide*, b_{15} 177–8°, which does not form salts. Refluxing 360.9 g. 3-(β-acetoxyethyl) analog of I in 1.5 l. 2% alc. HCl 3 hrs. gave 93.9% *3-(2-hydroxyethyl) analog* (III) of I, b_{16} 186–7°, m. 73–5°, which refluxed 2 hrs. with BzCl in C_6H_6 gave 86.1% *benzyloxyethyl analog*, b_6 234–6°, m. 110°. A mixt. of 8 g. *tert*-AmOH, 3 g. K, and 60 ml. MePh was refluxed 1 hr and treated with 10.3 g. III in MePh; after 2 hrs. at room temp. and treatment with 4.5 ml. MeI, the mixt. was kept 12 hrs. yielding 90.7% *6-chloro-4-methyl-2,3-(3',3'-dihydrofurano)pyridine* (IV), b_{16} 167–9°, m. 45.5–6°; *HCl salt*, m. 98–8.5°, hydrolyzed by H_2O. Hydrogenation of IV over Pd in 17% HCl gave 88.5% *4-methyl-3,3-(3',3'-dihydrofurano)pyridine-HCl* (V), m. 141–2°; *free base*, b_{15} 110.5–11°, m. 53–4°; *picrolonate*, decomp. 160–1°. V (4.3 g.) heated with 20 ml. $POCl_3$ in sealed tube 5 hrs. at 180–90° gave 77% *2-chloro-3-(2-chloroethyl)-4-methylpyridine*, b_4 113–14°, n_D^{20} 1.5533; *HCl salt*, m. 106.5–8°. To 5.1 g. powd. Na in Et_2O was added 40.3 g. II and the mixt. refluxed 60 hrs., treated with 10 ml. MeI, and refluxed 10 hrs., yielding a mixt., b_{16} 184°–b_4 370°. The 1st fraction, b_{16} 104–60°, was chilled, yielding 7.4 g. III, and the residual liquid was refluxed with BzCl in C_6H_6, yielding 22.5 g. mixed *Me ether* (VI) of III and IV; the Bz deriv. of III was left in the distn. residue. The mixed distillate was then treated with dry HCl in Et_2O, yielding 2.74 g. IV.*HCl* while the mother liquor gave 40.7% VI, b_{16} 154–6°, n_D^{20} 1.5392, d_{20} 1.255. When *tert*-AmOH (85 ml.) was refluxed with 10.1 g. Na in MePh and the cooled mixt. treated with 70 g. II and stirred 9 hrs., then treated with 35 ml. MeI and stirred 12 hrs. longer, there was obtained 8.1 g. III, b_4 166–8°, and a mixed fraction, b_4 130–60°, which was treated with dry HCl in Et_2O, yielding 45.9% IV.HCl, while the residual liquid gave 28% VI, b_{16} 153–5°. A similar reaction run with iso-PrONa gave 71.6% VI and a low yield of IV. Hydrogenation of VI over Pd in 17% HCl gave 91.3% *3-(2-methoxyethyl)-4-methylpyridine*, b_{15} 112–14°; *HCl salt*, m. 118–19°; *methiodide*, m. 129.5–31°, which sublimes on further heating.

G. M. Kosolapoff

Yakhontov, L. N.

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Synthesis of 2-formylquinuclidine. M. V. Rubtsov and L. N. Yakhontov (S. Ordzhonikidze All-Union Sci. Research Chem. Pharm. Inst., Moscow). *Zhur. Obshchei Khim.* 25, 2143–5(1955).—Heating 4.44 g. 2-quinuclidinecarboxylic acid HCl salt and 45 ml. $SOCl_2$ 14 hrs. at 60–8°, followed by removal of excess $SOCl_2$ *in vacuo* and addn. of the product to 8.1 g. PhNHMe in Et_2O at −2°, followed by stirring 2 hrs. and treatment with 50% K_2CO_3 gave *N-methylanilide* of *2-quinuclidinecarboxylic acid*, m. 95–6°. This (2.7 g.) treated with 0.21 g. $LiAlH_4$ in Et_2O at −5°, followed by aq. treatment and shaking out with $NaHSO_3$ soln., sepn. of the bisulfite adduct and its decompn. with satd. Na_2CO_3 gave 0.6 g. *2-formylquinuclidine*, $b_{0.4}$ 80–2°, $n^{22}D$ 1.5296; *HCl salt*, decomp. 228°; *picrate*, decomp. 218–19°; *phenylhydrazone*, m. 147–8°; *semicarbazone*, decomp. 244°. 2-Formylquinuclidine gives a red color with fuchsine-SO_2 and forms a Ag mirror with Tollens reagent.

G. M. Kosolapoff

Keeping 0.7 g. 2-formylquinuclidine, 3 ml. dry pyridine,

Yakhontov, L. N.

Synthesis of 3-vinylpiperidine. L. N. Yakhontov and [illegible]

[illegible] gave 3-(1-diethylaminoethyl)pyridine, b$_4$ 100–7°, n_D^{18} 1.5017; the di·HCl salt, m. 209–10°, was hydrogenated over Pt in EtOH yielding 3-(1-diethylaminoethyl)piperidine·2HCl, m. 118–19° (from C$_6$H$_6$), which with BzCl in aq. NaOAc gave the 1-Bz deriv., $C_{18}H_{28}N_2O$, b$_4$ 169–71°, n_D^{18} 1.5132; mono-MeI salt (I), m. 121–2°. I treated with 50% KOH and refluxed 1 hr. gave 70% 3-vinylpiperidine (II), b. 150–5°, n_D^{18} 1.4738; picrate, m. 161–3°. II with KMnO$_4$ in aq. H$_2$SO$_4$ gave after treatment of the crude products with BzCl, 1-benzoylnipecotinic acid (III) in EtOH. III was hydrolyzed with aq. HCl to nipecotinic acid·HCl, m. 230–40°. G. M. K.

YAKHONTOV, L. N.

Synthesis of the acetal of 1-benzoyl-4-(β-carbethoxy-β-formylethyl)piperidine. L. N. Yakhontov and M. V. Rubtsov (S. Ordzhonikidze All-Union Chem. Pharm. Research Inst., Moscow). *Zhur. Obshchei Khim.* 26, 2814-7 (1956); cf. *C.A.* 41, 7824.—Na (1.2 g.) in dry Et_2O treated at −2° in 1 hr. with 14.5 g. 1-benzoyl-4-(β-carbethoxyethyl)piperidine and 15.5 g. HCO_2Et, then, after 6 hrs. at −2°, with H_2O, unreacted material sepd. by extn. with Et_2O (7 g. recovered), the aq. soln. treated with 50 ml. AcOH, extd. with Et_2O, and the ext. evapd. gave the *unstable* form of *1-benzoyl-4-(β-carbethoxy-β-hydroxymethylenethyl)piperidine*, yellow oil, giving a double-bond test with $KMnO_4$ or Br and for a HOCH: group with $FeCl_3$; on standing 5 days it changed to the *stable* (*geometric*) *isomer* (I), m. 114-15°, which no longer gives a test for a HOCH: group but does give a test for the double bond; it does not contain a formyl group (neg. test with fuchsin-SO_2, Ag_2O, or $NaHSO_3$). On heating to 120° and cooling it reverts to the oily unstable form. Refluxing the product with 1% alc. HCl 8 hrs., evapn., extg. with Et_2O, washing the ext. with 5% NaOH to remove unreacted HO[illegible]

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Chem

YAKHONTOV, L.N.

OBOYMAKOVA, A.N.; YAKHONTOV, L.N.

Third pharmaceutical congress in the Polish People's Republic. (MLRA 10:3)
Apt.delo 6 no.1:71-77 Ja-F '57.
(PHARMACOLOGY)

YAKHONTOV, L.N.

Structure and synthesis of reserpine. Med.prom. 11 no.7:6-14 Jl '57.
(MIRA 10:8)

1. Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut imeni S.Ordzhonikidze
(RESERPINE)

YAKHONTOV, L.N.

TRAKHTENBERG, D.M., RODTSONOVSKAYA, E.I., GORDINA, Z.V., and YAKHONTOV, L.N.

"The Preparation of Crystalline Erythromycin," Med. Prom., No. 7, pp 14-19
1957 All-Union Sci. Res. Inst. Antibiotics

Translation U-3,055,486, 14 Jan 58

Yakhontov, L.N.

AUTHOR: L. N. Yakhontov (Moscow)

TITLE: Alkaloids of Rauwolfia* (Alkaloidy Rauvol'fii)

PERIODICAL: Uspekhi khimii, 1957, Vol. 26, No. 2, pp. 239-262 (U. S.S.R.)

ABSTRACTS: Scientists established about 20 years ago that Rauwolfia serpentina has a considerably hypotensive effect; a study of various species and their separated alkaloids showed a very valuable combination of a hypotensive and sedative action, as well as a favorable effect of these medical preparations when prescribed for psychic ailments. Since 1949, this study has become one of the most essential fields in the chemistry of alkaloids. By 1950, 7 alkaloids were known that could be separated from Rauwolfiz; this number rose to 15 in 1954, and 39 in 1957.

* The plant genus Rauwolfia belongs to the Apocynaceae family; name is derived from Leonard Rauwolf, a 16th century physician and traveller. Common name is Indian hemp; the chief representative is R. serpentina, growing in India, Burma, and on islands of the Malay Archipelago.

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Alkaloids of Rauwolfia

125 species of the genus are now known, and they occur in tropical and subtropical zones of all five continents.

The subject alkaloids are discussed in tabular and textual form (including extensive introduction of chemical ring systems) under these main headings:

1. Quaternary "anhydrone" bases;
2. Tertiary indoline alkaloids and bases;
3. Stereochemistry of alkaloids of the yohimbine group;
4. Syntheses in a number of derivatives of "yohimbane";
5. Pharmacology of Rauwolfia alkaloids (was found that the action of "reserpine" on an organism is closely connected with the former's structure and varies or disappears under comparatively slight variations in structure of this alkaloid.

The chemistry of alkaloids of Rauwolfia is a complex and rapidly developing branch of research. Rauwolfia alkaloids, especially reserpine, have been introduced into medical practice as valuable medical compounds; it should be noted that certain of the Rauwolfia alkaloids and similar substances were separated from other plants.

Card 2/4

Alkaloids of Rauwolfia

Pertinent personalities cited include the following: R. Robinson (35) who introduced the concept of "anhydrone bases" in 1925; P. Karrer (42, 43) who in 1949 conducted dehydrogenization (with selenium) of an alkaloid of corynantheine, deriving a compound called "corynanthyrin"; R. B. Woodward (58), who in 1956 made a final determination of the structure of "aimalin"; and V. Prelog (80), who, in the dehydrogenation of aricin with selenium, obtained a substance with a spectrum close to "alstyrene".

Table 1 lists 39 alkaloids, with some other alkaloids identical to them; other data are listed, including the melting point in ° C. for most alkaloids given. Tables 2-8 inclusive present chemical ring systems for the alkaloids discussed; other chemical rings are scattered through text. There are 159 references, 2 of which are Slavic.

Card 3/4

Alkaloids of Rauwolfia

ASSOCIATION:

PRESENTED BY:

SUBMITTED:

AVAILABLE:

Card 4/4

AUTHORS: Yakhontov, L. N., and Rubtsov, M. V.

TITLE: Synthesis of Quinuclidone-2

PERIODICAL: Zhurnal Obshchey Khimii, 1957, Vol. 27, No. 1, pp. 72-77 (U.S.S.R.)

ABSTRACT: Using ethyl ether of pyridyl-4-acetic acid, the authors synthesized a second oxo-derivative - quinuclidone-2 - which is bicyclic amide. The Arndt-Euster method giving a 37% yield of $CH_2COOC_2H_5$ from isonicotinic acid was found to be the most suitable for this type of reaction. Hydrogenation with a platinum catalyst prepared according to Adams gave a considerable yield of ethyl ether of piperidyl-4-acetic acetic acid. Saponification of the latter gave chlorohydrate of piperidyl-4-acetic acid which, by means of thionyl chloride, was converted into homologous acid chloride. By subjecting the latter to reaction with calcined potash in anhydrous chloroform, it converted into quinuclidone-2, an oily substance which together with hydroxylamine forms a crystalline oxime. The derivation of quinuclidone-2 oxime from ethyl ether of quinuclidine-carboxylic acid-2 is described.
There are 7 non-Slavic references.

Synthesis of Quinuclidone-2

ASSOCIATION: The All-Union Scientific-Research Chemical-Pharmaceutical Institute im. S. Ordzhonikidze (Vsesoyuznyy Nauchno-Issledovatel'skiy Khimiko-Farmatsevticheskiy Institut im. S. Ordzhonikidze)

PRESENTED BY:

SUBMITTED January 30, 1956

AVAILABLE:

Card 2/2

YAKHONTOV, L.N.

20-5-40/67

AUTHOR YAKHONTOV, L.N.,

TITLE On Some Chemical Features of 2,6-Dichlorderivates of Pyridine (O nekotorykh khimicheskikh osobennostyakh 2,6-dikhlorproizvodnykh piridina - Russian)

PERIODICAL Doklady Akademii Nauk SSSR, 1957, Vol 113, Nr 5, pp 1088-1089, (U.S.S.R.)
Received 7/1957 Reviewed 8/1957

ABSTRACT In the course of the synthesis of chinocludine derivatives a number of 3,4-substitutions of pirydine (I.) and their 2,6-dichlorderivates (II) was obtained. Acomparison of their properties made it poosible to disclose some chemical fatures of the latter compound which are in connection with the α,α'-atoms of haloid. In contrast to the corresponding dehaloidized compunds (I) the substances (II) form no salts with mineral acids and furnish no picrates. It is noteworthy that already the elimination of a single α-chlorsubstituent leads to the formation of a compound that can form a chlorhydrate. The author synthetized 2-chlorine-4-methyl-(oxymethylacetic ether)-pyridine and obtained its chlorhydrate be treating an ether solution of the base with alcohol-hydrogen chloride. The chlorhydrate is air-resistant, but is hydrolized by water. A further feature is the fact that the derivates concerned form no quaternary salts after being boiled for many hours in an acetone solution with iodomethane. This is, however, easily possible in the case of the correaponding dehaloidized compounds

Card 1/2

20-5-40/67

On Some Chemical Features of 2,6-Dichlorderivates of Pyridine.

(I) at room temperature. Thethird feature of the substances (II) is thatthey are unable to form N-oxides which are easily formed in the case of dehaloidized I.- substances when heated with hydrogen peroxide in ice acetic acid. The difficulties connected with the formation of all these salts and complex compouds can be due both to stereometric difficulties as well as to the suppression of the basis properties of nitrogen by the reduction of the density of the electrons inthe nitrogen atom at the expense of the α-,α'-haloid atoms which are recipients of electrons. The latter factor appears to be confirmed also by the lack of reactivity of the methyl group in the position 4 in the case of the 2,6-dichlorderivatives of pyridine II. Some examples are given. (3 Slavic references)

ASSOCIATION All Union Scientific Chemical-Paemaceutical Institue "ORDZHONIKIDZE,S."
PRESENTED BY NAZAROV, I.N., Member of the Academy.
SUBMITTED 8.12.1956.
AVAILABLE Library of Congress.
Card 2/2

AUTHORS: Yakhontov, L. N., Yatsenko, S. V., Rubtsov, M. V. 79-28-5-9/69

TITLE: Synthesis of Substituted Quinuclidyl-2-Carbinol (Sintez zameshchennykh khinuklidil-2-karbinolov)

PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 5, pp. 1177-1181 (USSR)

ABSTRACT: P. Rabe, in 1911 was the first to realize the synthesis of the substituted quinuclidyl-2-carbinols of the quinine-alkaloidal type (Reference 1). This method consists of the condensation of the ethylesters of β[N-benzoyl-piperidyl-(4)]-proprionic acid and any other acid (e. g. cinchoninic acid or quininic acid) with subsequent closing of the quinuclidine cycle, and by reduction of the obtained ketone with the corresponding substituted quinuclidyl-2-carbinol resulting as final product (see scheme 1). Until our time this scheme was the only one for the synthesis of substituted quinuclidyl-2-carbinols. According to this scheme quinine (Reference 2), hydroquinine (Reference 3) as well as a series of analogs and isomers

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Synthesis of Substituted Quinuclidyl-2-Carbinol 79-28-5-9/69

of quinine alkaloids (References 4-6) were synthetized. In the present work another method for the synthesis of substituted quinuclidyl-2-carbinols is described (see scheme 2). As initial product serves 2-formylquinuclidine (Reference 7) which in the conversion with different organomagnesium compounds forms the corresponding substituents of quinuclidyl-2-carbinol. This way the following carbinols were synthetized: (quinuclidyl-2)-methylcarbinol (I), (quinuclidyl-2)-ethylcarbinol (II) and (quinuclidyl-2)-(naphthyl-1-)-carbinol (III). The compound (I) was also obtained by reduction of the 2-acetylquinuclidine (Reference 8) (IV) in the presence of a platinum catalyst (scheme 3), on which occasion also a mixture of diastereoisomeric (quinuclidyl-2)-methylcarbinols formed in crystalline and oily state.
There are 8 references, 5 of which are Soviet.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut imeni S. Ordzhonikidze (All-Union Scientific Chemical and Pharmaceutical Research Institute imeni Ordzhonikidze)

SUBMITTED: April 15, 1957

Card 2/2

AUTHORS: Nikitskaya, Ye. S., Mikhlina, Ye. Ye., Yakhontov, L. N., Furshtatova, T. Ya. SOV/79-28-1o-32/6o

TITLE: Synthesis of the Hydrazines and Hydrazones of Some Heterocyclic and Aromatic Acids (Sintez gidrazidov i gidrazonov nekotorykh geterotsiklicheskikh i aromaticheskikh kislot)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol 28, Nr 1o, pp 2786 - 279o (USSR)

ABSTRACT: In earlier investigations (Ref 1) it was shown that the hydrazine of isonicotinic acid and its hydrazones develop an antitubercular activity. It was, therefore, of interest to the authors to synthesize the hydrazides and their derivatives of the pyridyl-4-acetic acid, β-(pyridyl-4)acrylic and β-(pyridic-4)-propionic acid, as these differ from the isonicotinoyl hydrazone only by the presence of one and more methyl groups between the pyridine nucleus and the hydrazine radical. Therefore it was desired to obtain hydrazides and hydrazones from acids of the pyperidine and quinuclidine series in order to explain the effect of the mentioned cycles on the biological effect of these compounds and to

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compare them in this respect with the similar compounds of the pyridine series. To this end the hydrazides of the following acids were synthesized: isonipecotinic, pyridyl-4-acetic-, piperidyl-4-acetic-, β-(pyridyl-4)propionic-, β-(piperidyl-4)propionic-, β-(pyridyl-4)-acrylic-, 6-methyl picolic- and α- quinuclidine carboxylic acid. As the p-nitro-benzoic acid is closely related to the isonicotinic acid, its hydrazide and hydrazones were also synthesized to explain its structure and activity. The synthesis of the hydrazides was carried out by the reaction of the ethyl esters of the acids with hydrazine hydrate in alcohol solution (Refs 5,6) already earlier synthesized by the authors. The subsequent reaction of the hydrazides with various aldehydes lead to the hydrazones. The constants of the obtained products, analyses and yields are given in tables 1-4. The biological investigation of the antitubercular activity showed that the synthesized products are much less effective than the corresponding derivatives of isonicotinic acid. There are 4 tables

Synthesis of the Hydrazines and Hydrazones of Some Heterocyclic and Aromatic Acids SOV/79-28-10-32/60

and 6 references, 3 of which are Soviet.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut imeni S.Ordzhonikidze (All-Union Scientific Chemopharmaceutical Research Institute imeni S.Ordzhonikidze)

SUBMITTED: September 28, 195.

Card 3/3

AUTHORS: Yakhontov, L.N., Rubtsov, M.V. SOV/79-28-11-45/55

TITLE: Reduction of the Harmine Derivatives to the Derivatives of the Pyridine Tetrahydro Harmine With Sodium Boro-Hydride ($NaBH_4$)

(Vosstanovleniye borgidridom natriya proizvodnykh garmina v proizvodnyye Py-tetragidrogarmina)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol 28, Nr 11, pp 3108-3112 (USSR)

ABSTRACT: The investigation of various methods of transforming the harmine derivatives by reduction to the Py-tetrahydro harmine derivatives caused the authors to conclude that the best reducing agent among those hitherto suggested in these methods is the sodium boro-hydride. It was shown that only the quaternary salts of harmine are reduced. The harmine itself and its non-quaternary derivatives do not react with $NaBH_4$. Therefore, in the cases where the derivatives of Py-tetrahydro harmine are not substituted at the Py-nitrogen the Py-N-chlorobenzylate of harmine is reduced with a subsequent removal of the benzyl group by the hydration of the Py-N-benzyl tetrahydro harmine on a palladium catalyst. This Py-N-chloro benzylate of harmine was obtained in a yield of 95 % by heating equimolecular amounts of harmine and benzyl chloride in benzyl alcohol at 120° within 12 hours.

SOV/79-28-11-45/55

Reduction of the Harmine Derivatives to the Derivatives of the Pyridine Tetrahydro Harmine With Sodium Boro-Hydride ($NaBH_4$)

The reduction of Py-N-chloro benzylate of the harmine takes place with methyl alcohol by gradual addition of sodium boro-hydride (duration 3 hours). The yield of the hydrochloride of Py-N-benzyl tetrahydro harmine amounted to 90 %. The Py-N-benzyl tetrahydro harmine was also obtained in another way: By the reduction of harmine with sodium alcoholate according to Fischer (Fisher-Ref 1) to the Py-tetrahydro harmine, which then was subjected to the benzylation by benzyl chloride with potash at 110-120°. The final product (as hydrochloride) (78 %) was identical with the previous. Both compounds had the same constants, the same solubility, the same results of the analyses, as well as the same ultraviolet spectra (Figure). The debenzylation of the Py-N-benzyl tetrahydro harmine obtained with sodium boro-hydride by the hydration on palladium also yielded Py-tetrahydro harmine, which was identical with that obtained by the reduction of harmine with sodium alcoholate (Scheme). Similar results were also obtained in the experiments with norharmine derivatives (Scheme 2).-There are 1 figure and 3 references, 1 of which is Soviet.

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SOV/79-28-11-45/55

Reduction of the Harmine Derivatives to the Derivatives of the Pyridine Tetrahydro Harmine With Sodium Boro-Hydride ($NaBH_4$)

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut imeni S.Ordzhonikidze (All-Union Scientific Chemo-Pharmaceutical Research Institute imeni S.Ordzhonikidze)

SUBMITTED: October 3, 1957

Card 3/3

AUTHORS: Yakhontov.L.N., Yatsenko,S.V., Rubtsov,M.V. SOV/79-28-11-47/55

TITLE: Synthesis of 4-Aminopiperidine (Sintez 4-aminopiperidina)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol 28, Nr 11, pp 3115-3119 (USSR)

ABSTRACT: The 4-aminopiperidine is a semiproduct for the production of biologically active compounds. According to reference 1 some N-substituted 4-aminopiperidines have spasmolitic activity (Ref 1). There is, however, no convenient synthesis of this compound mentioned in publications. Its two described syntheses by the reduction from 4-aminopyridine and from acyclic compounds give only small yields. In this paper a convenient preparative synthesis of the dichloro hydrate of 4-aminopiperidine from isonicotinic acid in two steps with a yield of 66 % is described. In its elaboration various ways of synthesizing the 4-aminopiperidine from isonicotinic acid were checked, which is now used as industrial raw material (Scheme). The reactions by Hofmann, Curtius,and Schmidt (Gofman,Kurtsius,Shmidt) were used for the transformation of the carboxyl group. According to the first method the isonicotinic acid according to reference 4 was converted by way of the ester into the amide and further on according to Hofmann into the aminopiperidine. Basing on the second method the isonicotinic acid was converted into hydrazide according to reference 6 by way of the

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Synthesis of 4-Aminopiperidine SOV/79-28-11-47/55

ester. This was reduced by way of platinum to the hydrazide of the isonipecotic acid, which according to Curtius was converted to the 4-aminopiperidine. The synthesis by the reduction of the isonicotinic acid to the isonipecotic acid with subsequent substitution of the carboxyl group by the amino group according to Schmidt turned out to be the most convenient method. The Schmidt reaction takes place best with sodium azide in the presence of H_2SO_4, as it is convenient in preparative respect and is not connected with a previous development of poisenous vapours of hydrazoic acids (yield 66 %) as is the case in using hydrazoic acid. In the checking of the first method according to Hofmann the catalytic reduction of the aminopyridine to the 4-aminopiperidine was realized.- There are 8 references, 1 of which is Soviet.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut imeni S.Ordzhonikidze (All-Union Scientific Chemo-Pharmaceutical Research Institute imeni S.Ordzhonikidze)

Card 2/2

YAKHONTOV, L.N.; KOLPAKOVA, V.V.; SHEYNKER, Yu.N.; PERVACHEVA, T.D.

Scientific research in the institutes of the Czechoslovak Republic. Med.prom. 13 no.11:55-58 N '59. (MIRA 13:3)

1. Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevtsevticheskiy institut imeni S. Ordzhonikidze.
(CZECHOSLOVAKIA--PHARMACEUTICAL RESEARCH)

YAKHONTOV, L.N.; KOPLAKOVA, V.V.; SHEYNKER, Yu.N.; PERVACHEVA, T.D.

Research at institutes of the Czechoslovak Republic. Med.prom. 13 no.12:52-55 D '59. (MIRA 13:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut imeni S. Ordzhonikidze.
(CZECHOSLOVAKIA--CHEMISTRY, MEDICAL AND PHARMACEUTICAL)